National Institute of Environmental Health Sciences

Fighting global warming: The potential of photocatalysis against CO2, CH4, N2O, CFCs, tropospheric O-3, BC and other major contributors to climate change

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Abstract:

At the laboratory scale, photocatalysis is a promising method to convert many air pollutants such as nitrogen oxides and volatile organic compounds, to safer products for human health but also environmentally more acceptable, such as nitrate and carbon dioxide. Indoor and industrial applications of photocatalysis to remove local air pollutants from the atmosphere are now numerous. Large scale outdoor applications of photocatalysis started with self-cleaning glass, coatings and paints for buildings, and several outdoor experiments have been documented regarding the photocatalytic reduction of NOx levels in urban environment, such as tunnels, streets and highways. The potential applications of photocatalysis, to remove or mitigate a wide range of global warming contributors from the atmosphere, seem an attractive method to help fighting climate change. By harnessing solar energy, photocatalytic processes consume less energy than conventional methods. This review article shows that photocatalysis may be applied successfully to eliminate or transform of all major long-lived well mixed greenhouse gases, but also soot and tropospheric ozone and other short-lived climate forcers. The cases of sulphur hexafluoride and nitrogen trifluoride are also discussed.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Unspecified Exposure

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Mitigation

Resource Type: ☑

format or standard characteristic of resource

Review

Timescale: ☑

time period studied

Time Scale Unspecified